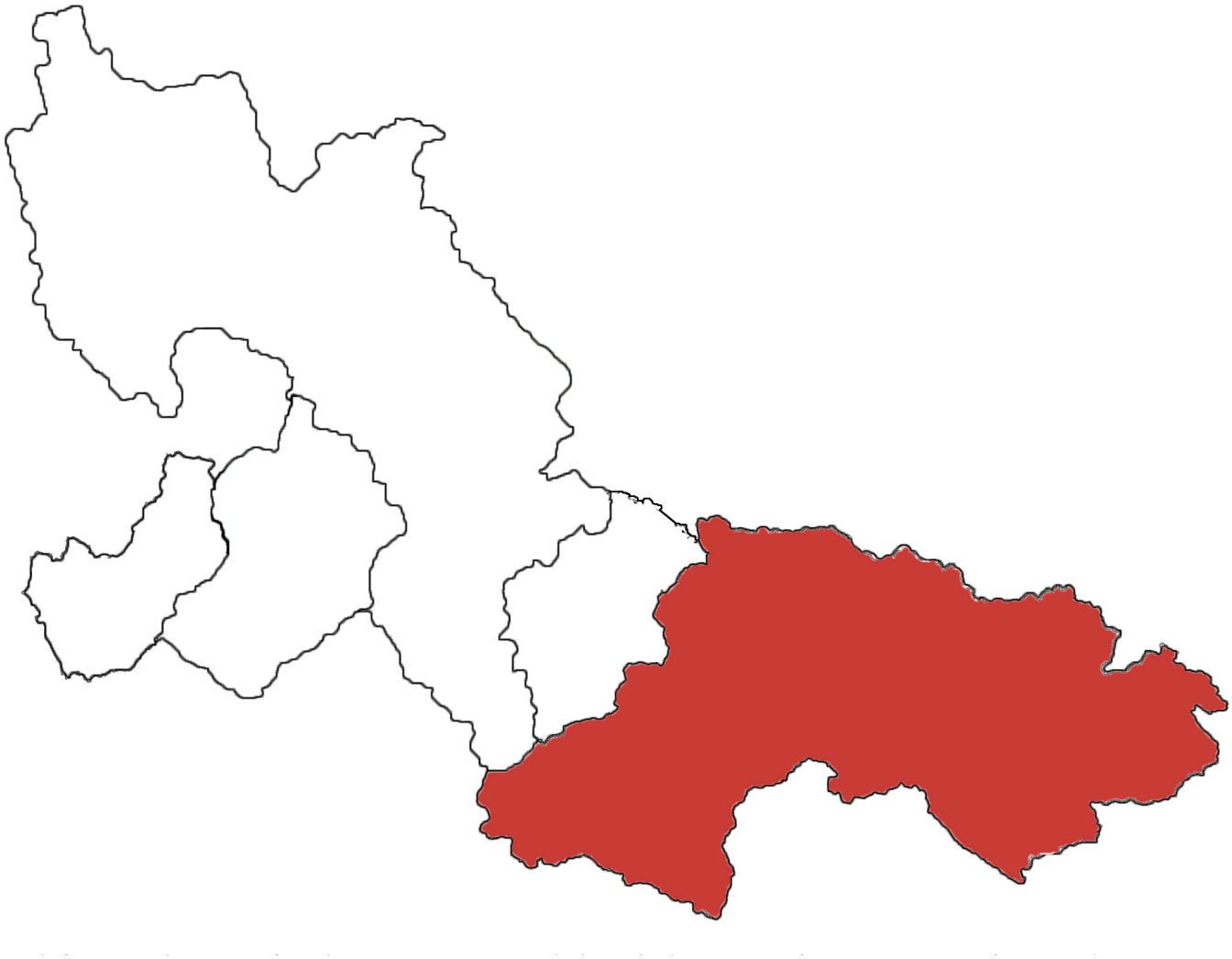
# Section 5.2
# Salt River Basin



### 5.2.1 Geography of the Salt River Basin

The Salt River Basin occupies the eastern part of the planning area and is the second largest basin at 5,232 square miles. Geographic features and principal communities are shown on Figure 5.2-1. The basin is characterized by mid- to high-elevation mountain ranges, plateaus and canyons. Vegetation types include: Sonoran desertscrub; semidesert, great plains, and subalpine grasslands; chaparral; evergreen woodland; and subalpine, woodland and montane conifer forests. Riparian vegetation includes mesquite, mixed broadleaf and tamarisk along the Salt River and mixed broadleaf along the Black River.

- Principal geographic features shown on Figure 5.2-1 are:
    - Principal basin communities of Miami, Globe and Whiteriver
    - Other basin communities of Tortilla Flat, Roosevelt, Young, McNary, Cibecue, Carrizo, Hon-dah, Fort Apache and Hannagan Meadow
    - Salt River running east to west through the southern part of the basin from the confluence of the White and Black Rivers
    - White River and its tributaries in the northeastern portion of the basin
    - Black River running from the eastern basin boundary to the Salt River, which also demarcates part of Graham, Apache, Navajo and Greenlee county boundaries
    - Other major tributaries to the Salt River including Cherry Creek, Canyon Creek, Cibecue Creek, Carrizo Creek and Cedar Creek
    - Theodore Roosevelt Lake in the western portion of the basin
    - Apache Lake, Canyon Lake and Saguaro Lake in the vicinity of Tortilla Flat
    - Hawley Lake, Sunrise Lake, Crescent Lake and Big Lake in the high-elevation northeastern portion of the basin
    - Salt River Canyon (not on map) along the Salt River and numerous side canyons such as Sycamore Canyon and Sawmill Canyon
    - Superstition and Pinal Mountains near the southwestern basin boundary
    - Mogollon Rim along the northern basin boundary
    - Natanes Plateau along the southern basin boundary in Gila and Graham counties
    - Bonito Prairie between the White and Black Rivers south of Fort Apache
    - White Mountains in Apache County which contain the highest peak in the basin Mt. Baldy at 11,403 feet
- Not well shown on Figure 5.2-1 are Four Peaks along the Maricopa and Gila County line in the Mazatzal Mountains and the Sierra Ancha Mountains south of Young

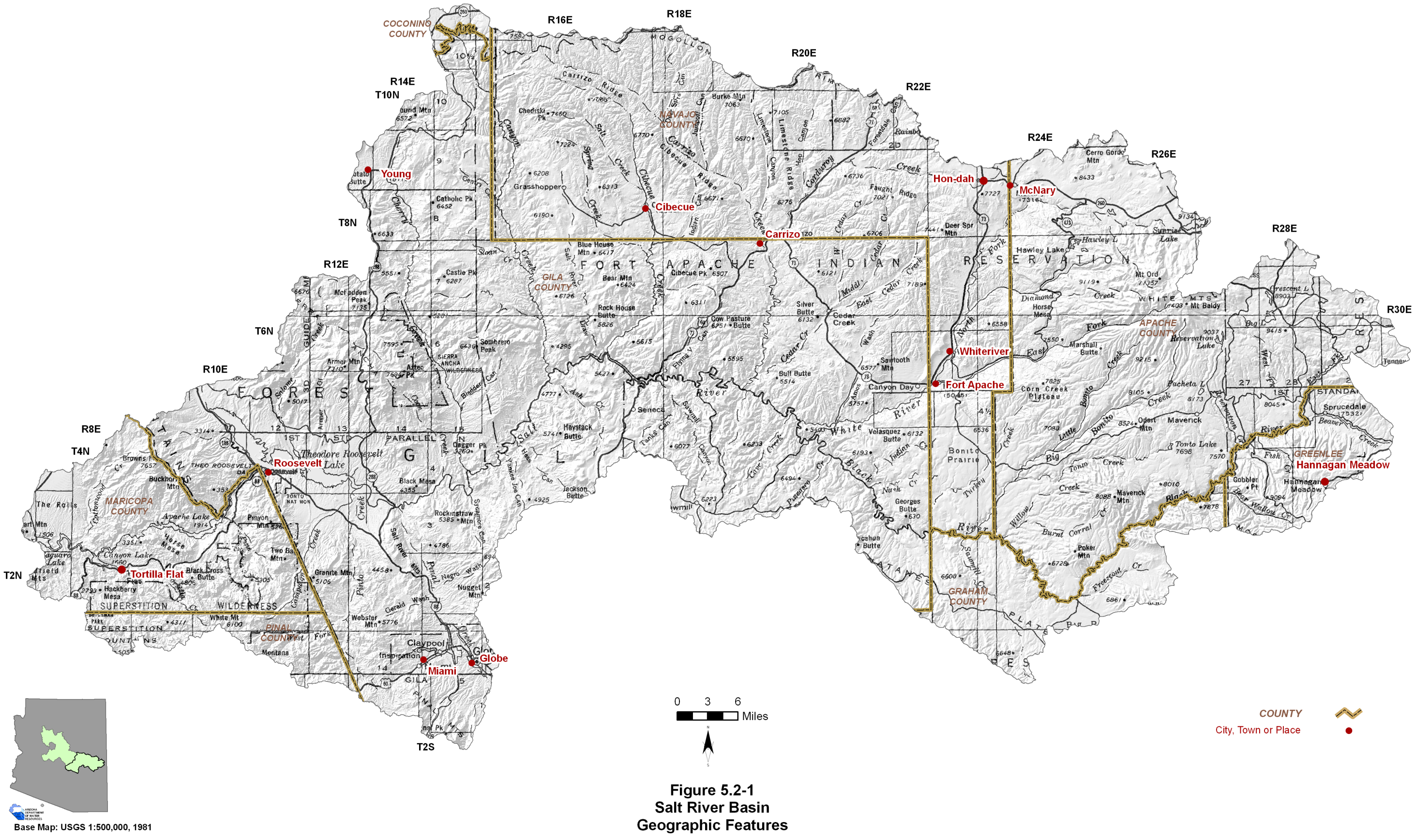



**Figure 5.2-1**
**Salt River Basin**
**Geographic Features**

### 5.2.2 Land Ownership in the Salt River Basin

Land ownership, including the percentage of ownership by category, for the Salt River Basin is shown in Figure 5.2-2. Principal features of land ownership in this basin are the large contiguous parcels of forest service and tribal lands. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of percentage from largest to smallest in the basin.

**Indian Reservation**

- 59.4% of the land is under tribal ownership.
- The basin includes two reservations, the Fort Apache Reservation in the north-central portion north of the Black River and the San Carlos Apache Reservation in the south-central portion of the basin.
- All tribal lands are contiguous.
- This basin contains the largest percentage of tribal lands in the planning area.
- Land uses include domestic, commercial, recreation, timber and ranching.

**National Forest and Wilderness**

- 38.6% of the land is federally owned and managed as National Forest and Wilderness.
- Forest lands in the basin are part of the Tonto and Apache-Sitgreaves National Forests.
- The basin contains approximately 236,000 acres in five wilderness areas, four in the Tonto National Forest and one in the Apache-Sitgreaves National Forest. Wilderness areas in the Tonto include the 18,515-acre Salome Wilderness, 21,007-acre Sierra Ancha Wilderness, a significant portion of the 160,135-acre Superstition Wilderness and the 32,088-acre Salt River Wilderness. A portion of the 11,336-acre Bear Wallow Wilderness in the Alpine Ranger District of the Apache-Sitgreaves National Forest is also located in the basin.
- There are numerous small private in-holdings in both forests.
- Land uses include recreation, grazing and timber production.

**Private**

- 1.5% of the land is private.
- The majority of the private land in the basin is in the vicinity of Miami/Globe and around Young. There are also numerous small private land in-holdings in the Tonto and Apache-Sitgreaves National Forests.
- Land uses include domestic, commercial, mining and ranching.

**U.S. Bureau of Land Management (BLM)**

- 0.2% of the land is federally owned and managed by the Safford Field Office Bureau of Land Management.
- All BLM lands are in the vicinity of Miami and Globe.
- Primary land uses are mining and grazing.

**State Trust Land**

- 0.1% of the land in this basin is held in trust for the public schools under the State Trust Land system.

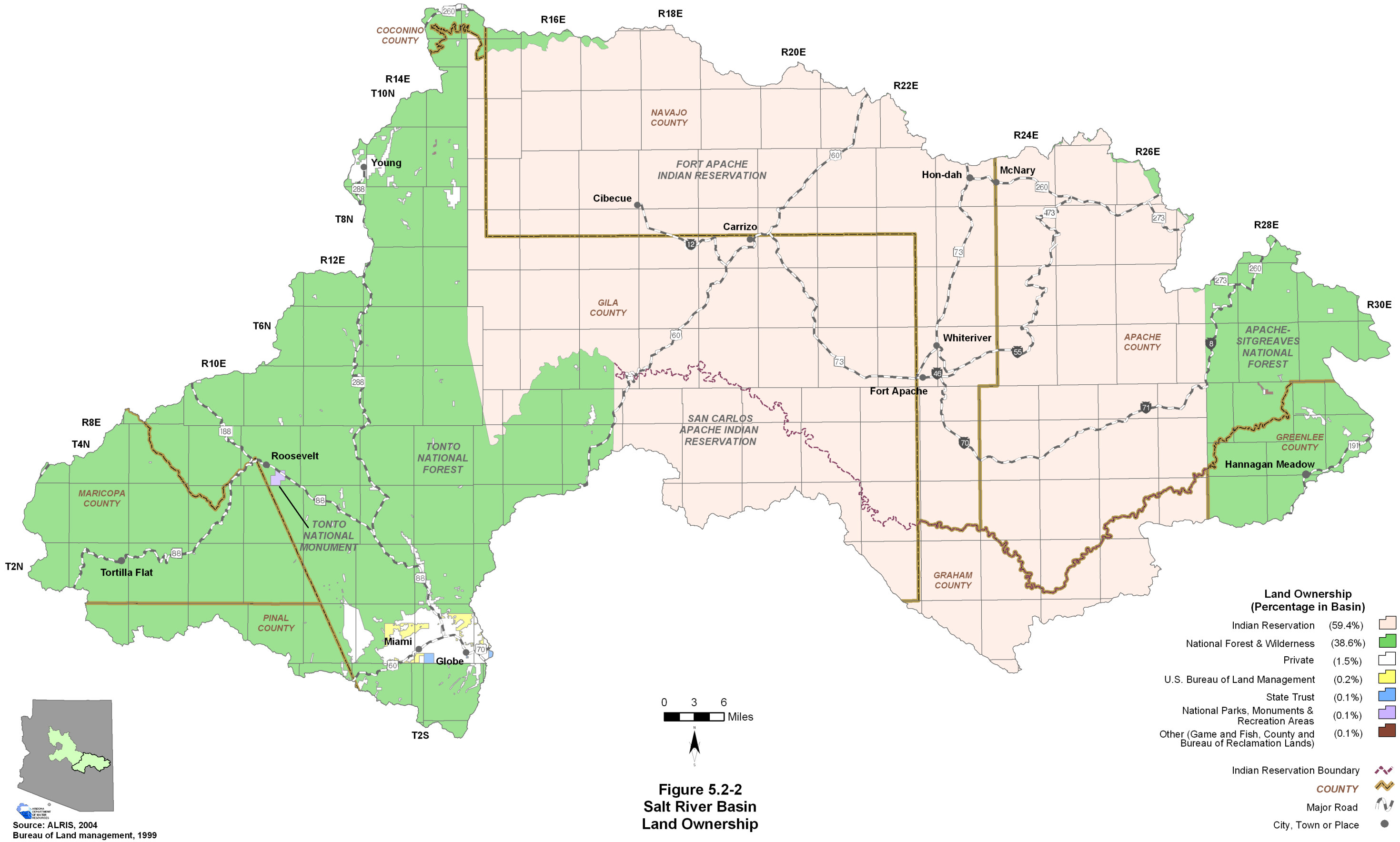
- All state land is in the vicinity of Miami and Globe.
- Primary land use is grazing.

**National Parks, Monuments and Recreation Areas**

- 0.1% of the land is federally owned and managed by the National Park Service as the Tonto National Monument, located in the southwestern portion of the basin near Roosevelt.
- Primary land use is cultural preservation and recreation.

**Other (Game and Fish, County and Bureau of Reclamation Lands)**

- 0.1% of the land is owned and managed by the Arizona Game and Fish Department.
- All "other" land is located north of the Greenlee and Apache County line.
- Primary land use is unknown.




Source: ALRIS, 2004
Bureau of Land management, 1999

**Figure 5.2-2**
**Salt River Basin**
**Land Ownership**

### 5.2.3 Climate of the Salt River Basin

Climate data from NOAA/NWS Co-op Network, Evaporation Pan and SNOTEL/Snowcourse stations are complied in Table 5.2-1 and the locations are shown on Figure 5.2-3. Figure 5.2-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Salt River Basin does not contain AZMET stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

**NOAA/NWS Co-op Network**

- Refer to Table 5.2-1A
- Elevations at the 13 NOAA/NWS Co-op network stations range from 1,710 feet at Mormon Flat to 8,180 feet at Hawley Lake.
- Minimum average temperature ranges from 24.3°F at Hawley Lake to 52.6°F at Mormon Flat.
- Maximum average temperature ranges from 90.3°F at Mormon Flat to 59.2°F at Hawley Lake.
- Station precipitation ranges from an average annual precipitation of 13.78 inches at Globe to 39.62 inches at Hawley Lake.
- Most stations report the highest seasonal rainfall in the summer (June-September) and all stations report the lowest seasonal rainfall in the spring (March-May).

**Evaporation Pan**

- Refer to Table 5.2-1B
- There are three evaporation pan sites in this basin, Hawley Lake, Roosevelt 1WNW and Whiteriver.
- The highest average annual pan evaporation rate is 96.71 inches at Roosevelt 1 WNW, elevation 2,200 feet, and the lowest is 33.17 inches at Hawley Lake, elevation 8,180 feet.

**SNOTEL/Snowcourse**

- Refer to table 5.2-1D
- There are 11 snow measurement sites in the basin. Five stations have been discontinued.
- The site elevation ranges from 6,900 feet at Workman Creek and Workman Creek SNOTEL to 9,200 feet at Maverick Fork SNOTEL.
- Seven sites record highest snowpack in March, three in February and one site, Workman Creek, has equally high snowpack in February and March.
- Highest average snowpack is 11.4 inches at Hannagan Meadows SNOTEL. Snowpack is measured in inches of snow water content. Ten inches of fresh snow can contain as little as 0.10 inches of water or up to 4 inches depending on a number of factors. The majority of U.S. snows fall with a water-to-snow ratio of between 0.04 and 0.10. (NSIDC, 2006)

**SCAS Precipitation Data**

- See Figure 5.2-3
- Additional precipitation data shows rainfall as high as 36 inches in several places in the basin and as low as 10 inches west of Tortilla Flat.
- In general, precipitation increases as altitude increases in this basin. The range of 24 inches between areas of highest and lowest precipitation is common for the planning area.

## Table 5.2-1 Climate Data for the Salt River Basin

**A. NOAA/NWS Co-op Network:**

| Station Name | Elevation (in feet) | Period of Record Used for Averages | Average Temperature Range (in F) | | Average Total Precipitation (in inches) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Max/Month | Min/Month | Winter | Spring | Summer | Fall | Annual |
| Black River Pumps | 6,040 | 1971-2000 | 71.8/Jul | 35.1/Jan | 4.97 | 2.00 | 8.27 | 4.57 | 19.81 |
| Cibecue | 5,050 | 1927-1979[1] | 73.7/Jul | 37.1/Jan | 5.57 | 2.00 | 5.34 | 6.08 | 18.98 |
| Globe | 3,550 | 1894-1975[1] | 82.7/Jul | 43.6/Jan | 2.86 | 1.17 | 4.78 | 4.97 | 13.78 |
| Globe 2 | 3,650 | 1971-2000 | 81.4/Jul | 43.4/Dec | 5.28 | 1.17 | 6.03 | 4.52 | 17.00 |
| Hawley Lake | 8,180 | 1967-1988[1] | 59.2/Jul | 24.3/Jan | 12.49 | 4.96 | 12.95 | 9.22 | 39.62 |
| Maverick | 7,810 | 1948-1967 | 60.1/Jul | 26.2/Jan | 7.07 | 2.56 | 12.02 | 6.21 | 27.86 |
| Miami | 3,560 | 1971-2000 | 83.4/Jul | 45.5/Jan | 6.38 | 1.36 | 6.45 | 5.30 | 19.49 |
| Mormon Flat | 1,710 | 1971-2000 | 90.3/Jul | 52.6/Dec | 5.15 | 1.02 | 4.39 | 4.01 | 14.57 |
| Pleasant Valley R.S. | 5,050 | 1971-2000 | 72.5/Jul | 38.2/Jan | 7.08 | 1.96 | 7.85 | 5.66 | 22.55 |
| Roosevelt 1WNW | 2,210 | 1971-2000 | 88.1/Jul | 48.4/Jan | 6.51 | 1.20 | 4.37 | 4.81 | 16.89 |
| Sierra Ancha | 5,100 | 1913-1979[1] | 77.1/Jul | 41.6/Jan | 9.45 | 2.58 | 7.39 | 8.67 | 28.09 |
| Whiteriver 1 SW | 5,120 | 1971-2000 | 72.4/Jul | 39.9/Jan | 5.55 | 2.02 | 7.81 | 4.76 | 20.14 |
| Young | 5,050 | 1903-1964 | 75.3/Jul, Aug | 36.9/Jan | 6.00 | 2.17 | 8.26 | 4.59 | 21.02 |

**Source:** WRCC, 2003.
**Notes:**
[1]Average temperature for period of record shown; average precipitation from 1971-2000

**B. Evaporation Pan:**

| Station Name | Elevation (in feet) | Period of Record Used for Averages | Avg. Annual Evap (in inches) |
|---|---|---|---|
| Hawley Lake | 8,180 | 1967 - 1988 | 33.17 |
| Roosevelt 1 WNW | 2,200 | 1905 - 2002 | 96.71 |
| Whiteriver | 5,280 | 1900 - 2002 | 77.65 |

**Source:** WRCC, 2003.

**C. AZMET:**

| Station Name | Elevation (in feet) | Period of Record | Average Annual Reference Evaportranspiration, in inches (N*umber of years to calculate averages*) |
|---|---|---|---|
| None | | | |

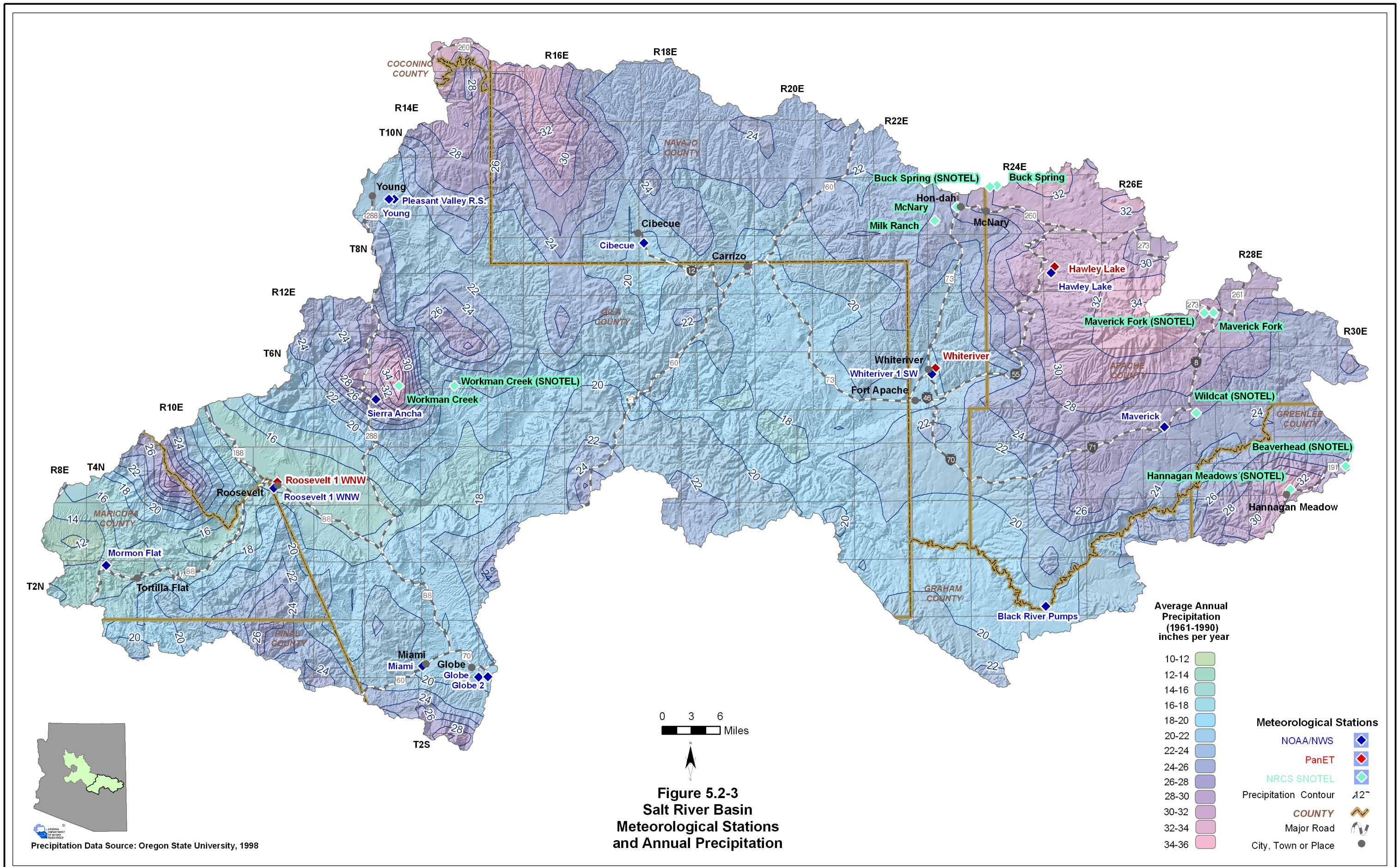
**Source:** Arizona Meteorological Network, 2005

## Table 5.2-1 Climate Data for the Salt River Basin (cont'd)

**D. SNOTEL/Snowcourse:**

| Station Name | Elevation (in feet) | Period of Record Used for Averages | Average Snowpack, at Beginning of the Month, as Inches Snow Water Content *(Number of measurements to calculate average)* | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Jan. | Feb. | March | April | May | June |
| Beaverhead SNOTEL | 7,990 | 1995 - current | 1.6 *(9)* | 2.3 *(9)* | 2.9 *(9)* | .7 *(9)* | 0 *(9)* | 0 *(9)* |
| Buck Sping | 7,400 | 1989 - current | 1.1*(6)* | 1*(6)* | 1.7*(6)* | 0.2*(6)* | 0*(0)* | 0*(0)* |
| Buck Spring SNOTEL | 7,400 | 1985 - 1997 (discontinued) | 2.6*(12)* | 4.5*(12)* | 4.0*(12)* | 0.8*(12)* | 0.1*(12)* | 0*(12)* |
| Hannagan Meadows SNOTEL | 9,020 | 1964 - current | 5.3*(29)* | 8.7*(41)* | 11.4*(41)* | 10.4*(41)* | 1.9*(24)* | 0*(22)* |
| Maverick Fork | 9,150 | 1975 - 2003 (discontinued) | 4.3*(26)* | 6.9*(48)* | 9.0*(49)* | 8.2*(47)* | 5.1*(1)* | 0*(0)* |
| Maverick Fork SNOTEL | 9,200 | 1950 - current | 4.3*(31)* | 7.4*(53)* | 9.8*(54)* | 8.3*(52)* | 0.5*(18)* | 0*(17)* |
| McNary | 7,200 | 1939 - 1989 (discontinued) | 1.9*(13)* | 2.8*(47)* | 2.5*(47)* | 0.8*(46)* | 0*(1)* | 0*(0)* |
| Milk Ranch | 7,000 | 1941 - 1989 (discontinued) | 0.9*(9)* | 1.9*(46)* | 1*(45)* | 0.4*(42)* | 0*(0)* | 0*(0)* |
| Wildcat SNOTEL | 7,850 | 1985 - current | 1.6*(20)* | 2.9*(20)* | 3.7*(20)* | 1.3*(20)* | 0*(20)* | 0*(20)* |
| Workman Creek | 6,900 | 1952 - 1993 (discontinued) | 2.7*(12)* | 4.7*(42)* | 4.7*(42)* | 2.8*(40)* | 0*(0)* | 0*(0)* |
| Workman Creek SNOTEL | 6,900 | 1961 - current | 2.3*(23)* | 5.2*(44)* | 5.5*(44)* | 3.0*(44)* | 0*(21)* | 0*(22)* |

**Source:** NRCS, 2005


COCONINO COUNTY
NAVAJO COUNTY
GILA COUNTY
MARICOPA COUNTY
PINAL COUNTY
APACHE COUNTY
GREENLEE COUNTY
GRAHAM COUNTY
R8E
R10E
R12E
R14E
R16E
R18E
R20E
R22E
R24E
R26E
R28E
R30E
T2N
T4N
T6N
T8N
T10N
Young
Pleasant Valley R.S.
Young
Cibecue
Cibecue
Carrizo
Buck Spring (SNOTEL)
Buck Spring
Hon-dah
McNary
Milk Ranch
McNary
Hawley Lake
Hawley Lake
Maverick Fork (SNOTEL)
Maverick Fork
Whiteriver
Whiteriver
Whiteriver 1 SW
Fort Apache
Workman Creek (SNOTEL)
Workman Creek
Sierra Ancha
Wildcat (SNOTEL)
Maverick
Beaverhead (SNOTEL)
Hannagan Meadows (SNOTEL)
Hannagan Meadow
Roosevelt
Roosevelt 1 WNW
Roosevelt 1 WNW
Mormon Flat
Tortilla Flat
Black River Pumps
Miami
Miami
Globe
Globe
Globe 2
0 3 6
Miles
Figure 5.2-3
Salt River Basin
Meteorological Stations
and Annual Precipitation
Precipitation Data Source: Oregon State University, 1998
Average Annual Precipitation (1961-1990) inches per year
10-12
12-14
14-16
16-18
18-20
20-22
22-24
24-26
26-28
28-30
30-32
32-34
34-36
Meteorological Stations
NOAA/NWS
PanET
NRCS SNOTEL
Precipitation Contour
COUNTY
Major Road
City, Town or Place

### 5.2.4 Surface Water Conditions in the Salt River Basin

Streamflow data, including average seasonal flow, average annual flow and other information is shown in Table 5.2-2. Flood ALERT equipment in the basin is shown in Table 5.2-3. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 5.2-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 5.2-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

**Streamflow Data**

- Refer to Table 5.2-2.
- Data from 33 stations located at 20 watercourses are shown in the table and on Figure 5.2-4. Nineteen of the 33 stations have been discontinued and eight of the 14 remaining stations are real-time stations.
- The average seasonal flow at 17 stations is highest in the winter (January-March) when between 38% and 73% of the average annual flow occurs. These stations are located primarily lower in the watershed or along tributaries. At 14 stations, located primarily along the major tributaries to the Salt River and higher in the watershed in the eastern part of the basin, the average seasonal flow is highest in the spring (April-June) due to snowmelt when between 34% and 68% of the average annual flow occurs.
- The average seasonal flow is lowest at most stations in the summer (July-September). These stations receive between 3% and 13% of their average annual seasonal flow at this time and are located in both the upper and lower portions of the watershed.
- The largest annual flow recorded in the basin is 3.2 maf in 1905 at the Salt River at Roosevelt gage with a contributing drainage area of 5,824 square miles.
- Nine streams in this basin have a mean and median annual flow of over 10,000 acre-feet. Three of those nine streams, Black River, White River and Salt River, have a mean annual flow of over 100,000 acre-feet.

**Flood ALERT Equipment**

- Refer to Table 5.2-3.
- As of October 2005 there were five stations in the basin, three in Gila County, one in Maricopa County and one in Navajo County.
- Of the five stations two are precipitation only stations, two are precipitation/stage stations and one is a weather station.

**Reservoirs and Stockponds**

- Refer to Table 5.2-4.
- The basin contains 13 large reservoirs. The largest is Roosevelt with a maximum capacity of 1,653,043 acre-feet.
- The most common use of the large reservoirs is recreation. The reservoirs on the Salt River supply hydroelectric power, irrigation and water supply for users in the Phoenix metropolitan area.

- Surface water is stored or could be stored in 62 small reservoirs in the basin.
- Total maximum storage for the 26 small reservoirs with greater than 15 acre-feet and less than 500 acre-feet capacity is 3,239 acre-feet. The total surface area for the remaining 36 small reservoirs is 410 acres.
- There are 807 registered stockponds in this basin.

**Runoff Contour**

- Refer to Figure 5.2-4.
- Average annual runoff is highest, 10 inches per year, in the White Mountains in the eastern portion of the basin and decreases to one inch per year in the southwestern portion of the basin.

## Table 5.2-2 Streamflow Data for Salt River Basin

| Station Number | USGS Station Name | Contributing Drainage Area (in $mi^2$) | Mean Basin Elevation (in feet) | Period of Record | Average Seasonal Flow (% of annual flow) | | | | Annual Flow/Year (in acre-feet) | | | | Years of Annual Flow Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Winter | Spring | Summer | Fall | Minimum | Median | Mean | Maximum | |
| 9489070 | North Fork of East Fork Black River near Alpine | 38 | 9,060 | 6/1965-9/1978 (discontinued) | 18 | 68 | 6 | 7 | 1,767 (1967) | 5,933 | 9,121 | 33,593 (1973) | 12 |
| 9489082 | North Fork of Thomas creek near Alpine | 1 | NA | 10/1985-9/2001 (discontinued) | 25 | 58 | 8 | 8 | 23 (1989) | 62 | 85 | 180 (1991) | 6 |
| 9489100 | Black River near Maverick | 315 | 8,700 | 10/1962-9/1982 (discontinued) | 28 | 49 | 10 | 13 | 27,591 (1977) | 86,899 | 102,892 | 225,938 (1973) | 19 |
| 9489200 | Pacheta Creek at Maverick | 15 | 8,810 | 10/1957-9/1980 (discontinued) | 22 | 63 | 7 | 8 | 789 (1961) | 4,851 | 6,443 | 17,593 (1973) | 22 |
| 9489500 | Black River below Pumping Plant near Point of Pines | 560 | 8,000 | 6/1953-current (real-time) | 37 | 42 | 9 | 13 | 28,459 (2002) | 127,452 | 151,168 | 434,496 (1993) | 49 |
| 9489700 | Big Bonito Creek near Fort Apache | 119 | 7,920 | 10/1957-9/1981 (discontinued) | 29 | 49 | 11 | 12 | 13,828 (1961) | 41,267 | 49,530 | 102,805 (1979) | 23 |
| 9490800 | North Fork White River near Greer | 40 | NA | 6/1965 - 9/1978 (discontinued) | 14 | 52 | 20 | 15 | 9704 (1971) | 15,569 | 17,842 | 40,915 (1973) | 13 |
| 9490000 | Turkey Creek near Fort Apache | 13 | NA | 6/1955-9/1960 (discontinued) | 68 | 18 | 6 | 8 | 442 (1957) | 514 | 1,017 | 2,599 (1958) | 4 |
| 9492000 | North Fork white River at White River | 357 | NA | 10/1916 - 6/1922 (discontinued) | 21 | 43 | 26 | 10 | 76,906 (1918) | 109,638 | 118.159 | 167,933 (1919) | 3 |
| 9490500 | Black River near Fort Apache | 1,232 | 7,200 | 11/1912-current | 42 | 35 | 9 | 15 | 45,188 (2002) | 233,904 | 280,932 | 818,301 (1993) | 45 |
| 9491000 | North Fork White River near McNary | 66 | 9,320 | 6/1945-9/1985 (discontinued) | 15 | 57 | 16 | 13 | 12,673 (1951) | 32,442 | 34,855 | 73,140 (1983) | 31 |
| 9492400 | East Fork White River near Fort Apache | 39 | 8,580 | 8/1957-current | 18 | 53 | 16 | 13 | 6,930 (2002) | 24,984 | 25,517 | 54,457 (1993) | 45 |
| 9492500 | Rock Creek near Fort Apache | 20 | NA | 6/1955-9/1960 (discontinued) | 50 | 34 | 9 | 8 | 217 (1958) | 1,770 | 1,613 | 2,693 (1957) | 4 |
| 9493500 | White River at Fort Apache | 499 | NA | 10/1912-6/1922 (discontinued) | 28 | 44 | 22 | 7 | 110,217 (1918) | 196,247 | 214,840 | 356,649 (1916) | 4 |
| 9494000 | White River near Fort Apache | 632 | 7,400 | 10/1917-current | 28 | 48 | 12 | 12 | 27,446 (2002) | 149,177 | 144,517 | 345,424 (1993) | 45 |
| 9494300 | Carrizo Creek above Corduroy Creek near Show Low | 225 | NA | 10/1953-6/1967 (discontinued) | 47 | 12 | 8 | 32 | 1,926 (1961) | 6,501 | 8,683 | 28,886 (1965) | 13 |
| 9494500 | Corduroy Creek above Forestdale Creek near Show Low | 57 | NA | 9/1952-6/1961 (discontinued) | 64 | 4 | 5 | 27 | 333 (1955) | 2,404 | 2,867 | 6,306 (1960) | 8 |
| 9495500 | Forestdale Creek near Show Low | 33 | NA | 9/1952-6/1961 (discontinued) | 28 | 34 | 27 | 11 | 87 (1956) | 1,314 | 2,190 | 7,023 (1960) | 8 |

## Table 5.2-2 Streamflow Data for Salt River Basin (cont'd)

| Station Number | USGS Station Name | Contributing Drainage Area (in $mi^2$) | Mean Basin Elevation (in feet) | Period of Record | Average Seasonal Flow (% of annual flow) | | | | Annual Flow/Year (in acre-feet) | | | | Years of Annual Flow Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Winter | Spring | Summer | Fall | Minimum | Median | Mean | Maximum | |
| 9496000 | Corduroy Creek near mouth near Show Low | 203 | 6,370 | 9/1951-current | 54 | 17 | 7 | 21 | 1,600 (1970) | 11,149 | 16,380 | 63,927 (1973) | 23 |
| 9496500 | Carrizo Creek near Show Low | 439 | 6,320 | 6/1951-current | 28 | 49 | 10 | 13 | 3,758 (1956) | 22,232 | 35,030 | 124,556 (1993) | 41 |
| 9496600 | Cibecue 1 Tributary Carrizo Creek near Show Low | 0.1 | 5,390 | 6/1958-9/1971 (discontinued) | 0 | 0 | 80 | 20 | 1 (1960) | 6 | 8 | 22 (1964) | 12 |
| 9496700 | Cibecue 2 Tributary Carrizo Creek near Show Low | 0.1 | 5,240 | 6/1958-9/1971 (discontinued) | 4 | 0 | 71 | 25 | 2 (1960-1961,1968) | 4 | 6 | 17 (1963) | 12 |
| 9497500 | Salt River near Chrysotile | 2,849 | 6,730 | 9/1924-current (real-time) | 38 | 36 | 12 | 14 | 128,176 (2002) | 393,581 | 474,817 | 1,459,907 (1993) | 78 |
| 9497800 | Cibecue Creek near Chysotile | 295 | 5,700 | 5/1959-current | 45 | 17 | 18 | 21 | 10,066 (1961) | 23,535 | 32,597 | 128,176 (1993) | 43 |
| 9497850 | Canyon Creek near Globe | 316 | NA | 10/1975 - 9/1981 (discontinued) | 66 | 15 | 4 | 15 | 13,759 (1981) | 99,282 | 81,149 | 147,149 (1979) | 5 |
| 9497900 | Cherry Creek near Young | 62 | 6,030 | 8/1963-9/1977 (discontinued) | 49 | 13 | 8 | 29 | 1,289 (1964) | 5,495 | 7,817 | 20,706 (1965) | 13 |
| 9497980 | Cherry Creek near Globe | 200 | 5,600 | 5/1965-current (real-time) | 57 | 11 | 9 | 23 | 2,600 (2002) | 15,026 | 24,302 | 84,003 (1993) | 36 |
| 9498400 | Pinal Creek at Inspiration Dam near Globe | 162 | NA | 7/1980-current (real-time) | 49 | 16 | 16 | 19 | 2,868 (1999) | 6,087 | 8,980 | 61,481 (1993) | 22 |
| 9498500 | Salt River near Roosevelt | 4,306 | 6,190 | 1/1913-current (real-time) | 41 | 31 | 13 | 15 | 152,798 (2002) | 518,499 | 644,942 | 2,422,315 (1916) | 89 |
| 9500500 | Salt River at Roosevelt | 5,824 | NA | 1/1904-12/1907 (discontinued) | 45 | 29 | 9 | 17 | 254,840 (1904) | 1,321,983 | 1,531,574 | 3,227,492 (1905) | 4 |
| 9498501 | Pinto Creek below Haunted Canyon near Miami | 37 | NA | 10/1995-current (real-time) | 70 | 12 | 3 | 14 | 130 (2002) | 1,709 | 1,600 | 3,722 (1998) | 7 |
| 9498502 | Pinto Creek near Miami | 102 | NA | 9/1994-current (real-time) | 68 | 15 | 8 | 9 | 449 (1996) | 4,168 | 5,757 | 19,480 (1995) | 8 |
| 9498503 | South Fork Parker Creek near Roosevelt | 1 | NA | 11/1985-current (real-time) | 73 | 15 | 3 | 10 | 3 (2002) | 192 | 266 | 1,036 (1995) | 14 |

**Sources:** USGS NWIS, USGS 1998 and USGS 2003.

**Notes:**
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Annual Flows may not equal 100 due to rounding.
Period of record may not equal Year of Record used for annual Flow/Year statistics due to only using years with a 12 month record

**Table 5.2-3 Flood ALERT Equipment in the Salt River Basin**

| Station ID | Station Name | Station Type | Install Date | Responsibility |
|---|---|---|---|---|
| 81 | Roosevelt Fire Station | Precipitation | 10/2/04 | Gila County FCD |
| 910 | Beer Tree Crossing Pinal Creek | Precipitation/Stage | NA | Gila County FCD |
| 920 | Guzman Crossing Pinal Creek | Precipitation/Stage | NA | Gila County FCD |
| 1712 | Pinetop County Club | Precipitation | NA | Navajo County FCD |
| 6780 | Saguaro Lake | Weather Station | 1/24/00 | Maricopa County FCD |

FCD = Flood Control District
NA = Not available

**Table 5.2-4 Reservoirs and Stockponds in the Salt River Basin**

### A. Large Reservoirs (500 acre-feet capacity and greater)

| MAP KEY | RESERVOIR/LAKE NAME (Name of dam, if different) | OWNER/OPERATOR | MAXIMUM STORAGE (AF) | USE[1] | JURISDICTION |
|---|---|---|---|---|---|
| 1 | Roosevelt | Bureau of Reclamation | 1,653,043 | H,I,R,S | Federal |
| 2 | Apache (Horse Mesa Dam) | Bureau of Reclamation | 245,048 | H,I,R,S | Federal |
| 3 | Saguaro (Stewart Mountain Dam) | Bureau of Reclamation | 68,800 | H,I,S | Federal |
| 4 | Canyon (Mormon Flat Dam) | Bureau of Reclamation | 57,900 | H,I,R,S | Federal |
| 5 | Sunrise | White Mountain Apache Tribe | 15,000[2] | R | Tribal |
| 6 | Big | AZ Game & Fish | 10,100 | R | State |
| 7 | Reservation | San Carlos Apache Tribe | 6,000[2] | R | Tribal |
| 8 | Crescent | AZ Game & Fish | 5,800 | F,R | State |
| 9 | Horseshoe Cienega | White Mountain Apache Tribe | 1,170 | R | Tribal |
| 10 | Cyclone | White Mountain Apache Tribe | 775 | R | Tribal |
| 11 | Hawley (Davis Dam) | White Mountain Apache Tribe | 650 | F,R | Tribal |

**Source:** US Army Corps of Engineers 2005 and others

### B: Other Large Reservoirs (50 acre surface area or greater)

| MAP KEY | RESERVOIR/LAKE NAME (Name of dam, if different) | OWNER/OPERATOR | MAXIMUM SURFACE AREA (acres) | USE | JURISDICTION |
|---|---|---|---|---|---|
| 12 | Nash Creek | White Apache Tribe | 69 | R | Tribal |

### C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)

**Total number: 26**
**Total maximum storage: 3,239 acre-feet**

### D. Other Small Reservoirs (between 5 and 50 acres surface area)[3]

**Total number: 36**
**Total surface area: 410 acres**

### E. Stockponds (up to 15 acre-feet capacity)

**Total number: 807 (from water right filings)**

**Notes:**
[1]F=fish & wildlife pond; H=hydroelectric; I=irrigation; R=recreation; S=water supply
[2]Normal capacity < 500acre-feet


**Figure 5.2-4**
**Salt River Basin**
**Surface Water Conditions**

### 5.2.5 Perennial/Intermittent Streams and Major Springs in the Salt River Basin

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the basin are shown in Table 5.2-5. The locations of major springs and perennial and intermittent streams are shown on Figure 5.2-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- There are numerous perennial streams located throughout the basin, particularly in the high elevation eastern portion, and include the Salt River, Black River, White River, East Fork White River, North Fork White River, Carrizo Creek, Cibecue Creek, Canyon Creek and Cherry Creek.
- Most of the intermittent streams are found in the western portion of the basin.
- There are 26 major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time.
- Listed discharge rates may not be indicative of current conditions. Many of the measurements were taken during or prior to 1952.
- Springs are found throughout the basin with the largest concentration of springs in the vicinity of McNary. The greatest discharge rate was measured on the White River, south of Hon-dah (Alchesay, 8,980 gpm).
- Fourteen of the major springs have a measured discharge rate of 100 gpm or greater and four springs have discharge rates of 1,000 gpm or greater.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 5.2-5B. There is one minor spring identified in this basin.
- The total number of springs, regardless of discharge, identified by the USGS varies from 624 to 822, depending on the database reference.

## Table 5.2-5 Springs in the Salt River Basin

**A. Major Springs (10 gpm or greater):**

| Map Key | Name | Location | | Discharge (in gpm)[1] | Date Discharge Measured |
|---|---|---|---|---|---|
| | | Latitude | Longitude | | |
| 1 | Alchesay | 335641 | 1095523 | 8,980 | During or prior to 1952 |
| 2 | Canyon[2] | 334040 | 1111242 | 2,224 | During or prior to 2001 |
| 3 | Mann[2] | 340340 | 1094810 | 1,980 | 10/24/1979 |
| 4 | Gosseberry Creek | 340654 | 1094117 | 1,000 | 5/22/1952 |
| 5 | Warm | 334403 | 1101256 | 874 | During or prior to 1982 |
| 6 | Unnamed | 341740 | 1104858 | 480 | 11/5/2002 |
| 7 | Unnamed | 341738 | 1104853 | 410 | 11/5/2002 |
| 8 | Unnamed | 341738 | 1104853 | 310 | 11/5/2002 |
| 9 | Blue Lake | 340402 | 1094805 | 260 | 5/19/1952 |
| 10 | Gomez[2, 3] | 340338 | 1095156 | 200 | 6/18/1946 |
| 11 | Boy | 340420 | 1094703 | 200 | 5/20/1952 |
| 12 | Ess | 334049 | 1093308 | 200 | 6/18/1952 |
| 13 | Big | 340539 | 1095932 | 150 | 6/20/1952 |
| 14 | Upper Bull Cienega | 340348 | 1095315 | 100[4] | 6/20/1952 |
| 15 | Government[2] | 340410 | 1095210 | 75 | 6/18/1946 |
| 16 | Maurel[2, 3] | 332422 | 1104425 | 50 | 4/11/1946 |
| 17 | Unnamed[2, 3] | 334942 | 1095100 | 40 | 2/19/1952 |
| 18 | Haystack # 1[2] | 340450 | 1095037 | 40[4] | 6/18/1946 |
| 19 | Unnamed[3] | 334430 | 1101316 | 30[5] | During or prior to 1992 |
| 20 | Earl Spring # 3[2] | 340424 | 1095123 | 20[4] | 6/18/1946 |
| 21 | Unnamed[3] | 340441 | 1094840 | 20[4] | 6/20/1946 |
| 22 | Haystack # 2[2] | 340450 | 1095052 | 20 | 6/18/1946 |
| 23 | Columbine | 335631 | 1095510 | Greater than 10 | 6/5/2005 |
| 24 | White | 341109 | 1103055 | Greater than 10 | 6/6/2005 |
| 25 | Williams (Fish Hatchery) | 340341 | 1094832 | Greater than 10 | 6/5/2005 |
| 26 | Unnamed[3] | 334414 | 1101339 | 10[5] | During or prior to 1982 |

**B. Minor Springs (1 to 10 gpm):**

| Name[1] | Location | | Discharge (in gpm)[1] | Date Discharge Measured |
|---|---|---|---|---|
| | Latitude | Longitude | | |
| Bull Cienega | 340348 | 1095314 | 2 | 6/20/1952 |

**C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and NHD, 2006):** 624 to 822

**Notes:**
[1]Most recent measurement identified by ADWR
[2]Spring is not displayed on current USGS topo maps
[3]Location approximated by ADWR
[4]Estimated discharge
[5]Average discharge

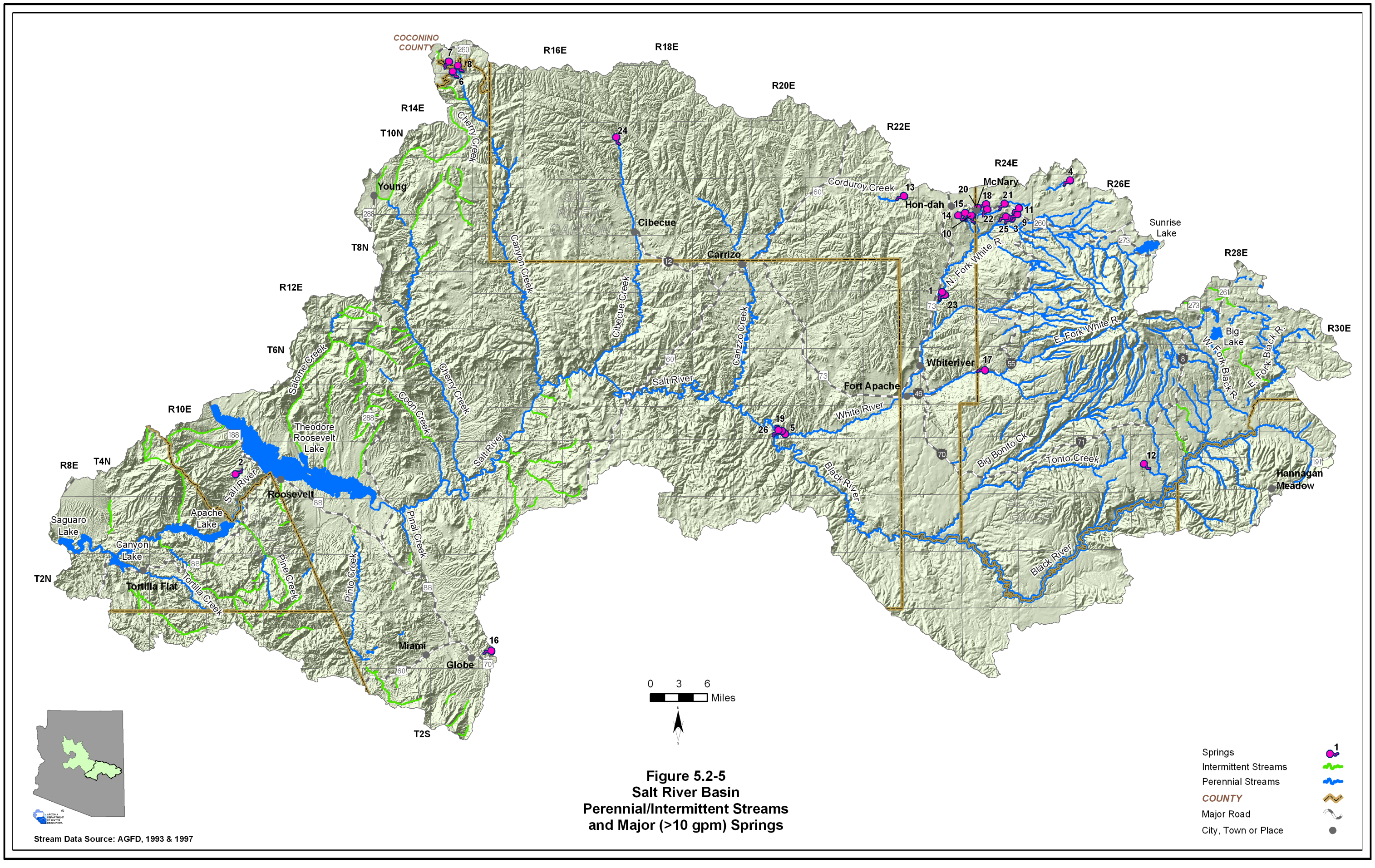



**Figure 5.2-5**
**Salt River Basin**
**Perennial/Intermittent Streams**
**and Major (>10 gpm) Springs**

### 5.2.6 Groundwater Conditions of the Salt River Basin

Major aquifers, well yields, estimated natural recharge, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 5.2-6. Figure 5.2-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 5.2-7 contains hydrographs for selected wells shown on Figure 5.2-6. Figure 5.2-8 shows well yields in five yield categories. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

**Major Aquifers**

- Refer to Table 5.2-6 and Figure 5.2-6.
- Major aquifers in the basin include recent stream alluvium, volcanic rock (Pinetop-Lakeside Aquifer) and sedimentary rock (Gila Conglomerate, and C and R Aquifers).
- Most of the basin geology consists of consolidated crystalline and sedimentary rock.
- The basin contains four sub-basins: Black River, White River, Salt River Canyon and Salt River Lakes.
- Flow directions are generally not available due to the consolidated nature of the basin geology. Groundwater flow in the C-aquifer in the northwestern portion of the basin is from north to south.

**Well Yields**

- Refer to Table 5.2-6 and Figure 5.2-8.
- As shown on Figure 5.2-8, well yields in this basin range from less than 100 gallons per minute (gpm) to greater than 2,000 gpm.
- One source of well yield information, based on 140 reported wells, indicates that the median well yield in this basin is 170 gpm.
- Well yields vary throughout the basin, with the lowest and the highest well yields found in the Globe-Miami area in unconsolidated sediments.

**Natural Recharge**

- Refer to Table 5.2-6.
- The estimate of natural recharge for this basin is 178,000 acre-feet per year.

**Water in Storage**

- Refer to Table 5.2-6.
- There is one estimate of water in storage for this basin. This estimate, from a 1992 ADWR study, indicates the basin has more than 8,700,000 acre-feet in storage to a depth of 1,200 feet.

**Water Level**

- Refer to Figure 5.2-6. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures one index well in this basin, located near Young.
- There are no recorded well sweeps in this basin.
- All water level information is from the western portion of the basin. The deepest recorded

water level is 82 feet and the shallowest is eight feet, both located north of Miami-Globe.

- Hydrographs corresponding to selected wells shown on Figure 5.2-6 but covering a longer time period are shown in Figure 5.2-7.

## Table 5.2-6 Groundwater Data for the Salt River Basin

| | | |
|---|---|---|
| **Basin Area, in square miles:** | 5,232 | |
| **Major Aquifer(s):** | **Name and/or Geologic Units** | |
| | Recent Stream Alluvium | |
| | Volcanic Rock (Pinetop-Lakeside Aquifer) | |
| | Sedimentary Rock (Gila Conglomerate) | |
| | Sedimentary Rock (C and R Aquifers) | |
| **Well Yields, in gal/min:** | 60<br>(1 well measured) | Measured by ADWR and/or USGS |
| | Range 2-2,000<br>Median 170<br>(140 wells reported) | Reported on registration forms for large (> 10-inch) diameter wells |
| | Range 10-300 | ADWR (1990 and 1994) |
| | Range 0-500 | USGS (1994) |
| **Estimated Natural Recharge, in acre-feet/year:** | 178,000 | Freethey and Anderson (1986) |
| **Estimated Water Currently in Storage, in acre-feet:** | N/A | ADWR (1994) |
| | >8,700,000 (to 1,200 ft) | ADWR (1992) |
| | N/A | Freethey and Anderson (1986) |
| | N/A | Arizona Water Commission (1975) |
| **Current Number of Index Wells:** | 1 | |
| **Date of Last Water-level Sweep:** | N/A | |

NA - Not available

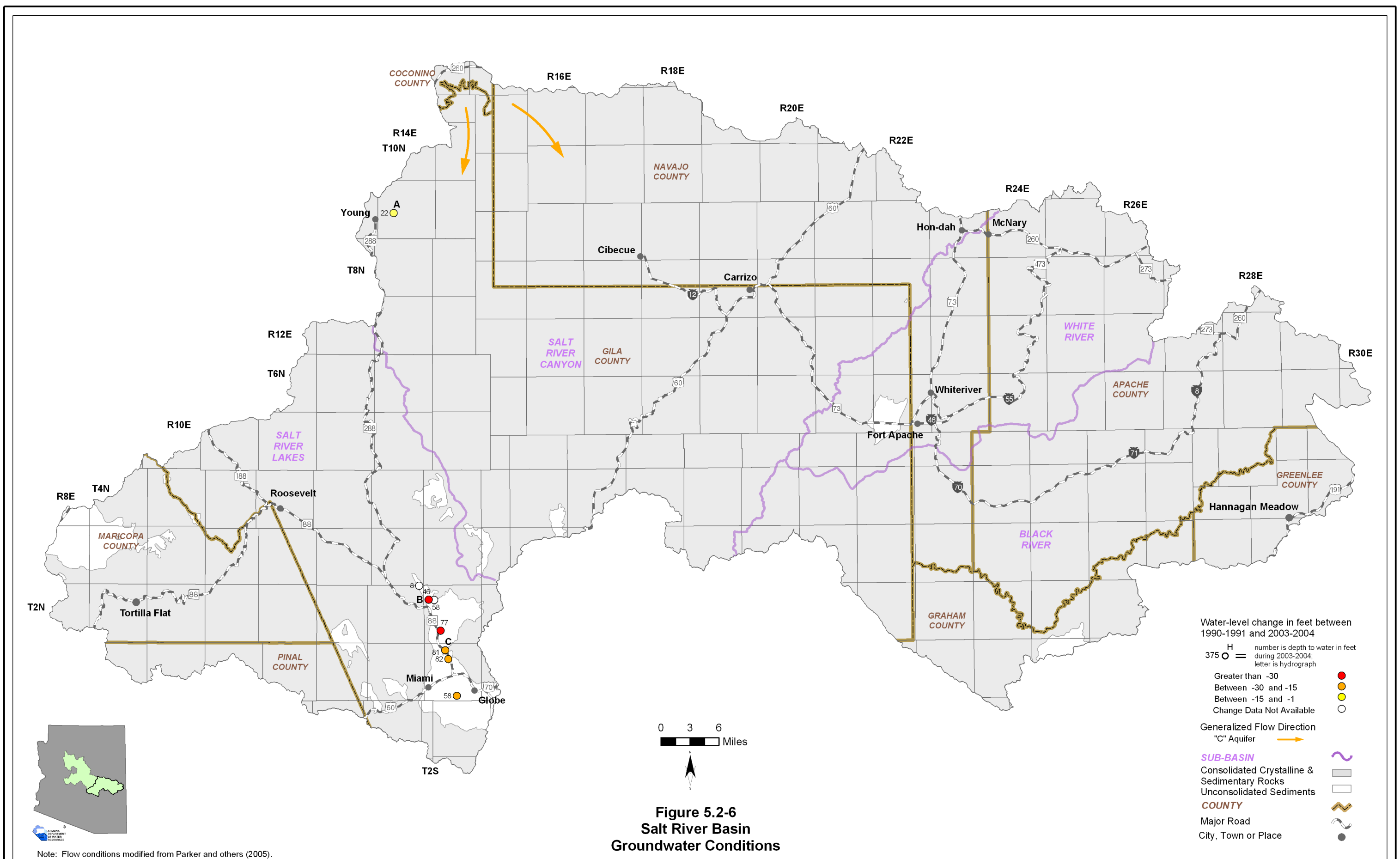
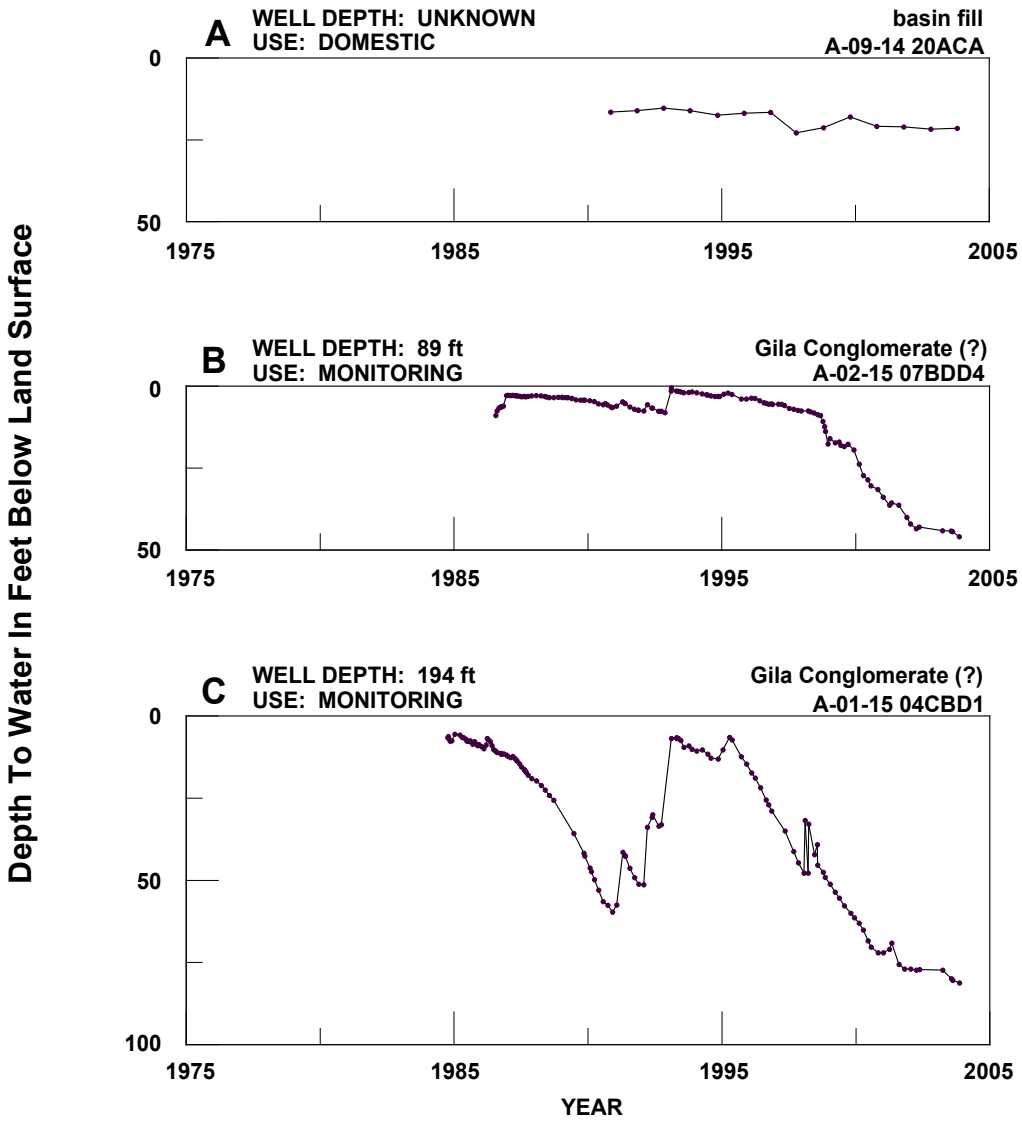



**Figure 5.2-6**
**Salt River Basin**
**Groundwater Conditions**

Note: Flow conditions modified from Parker and others (2005).

## Figure 5.2-7
## Salt River Basin
## Hydrographs Showing Depth to Water in Selected Wells



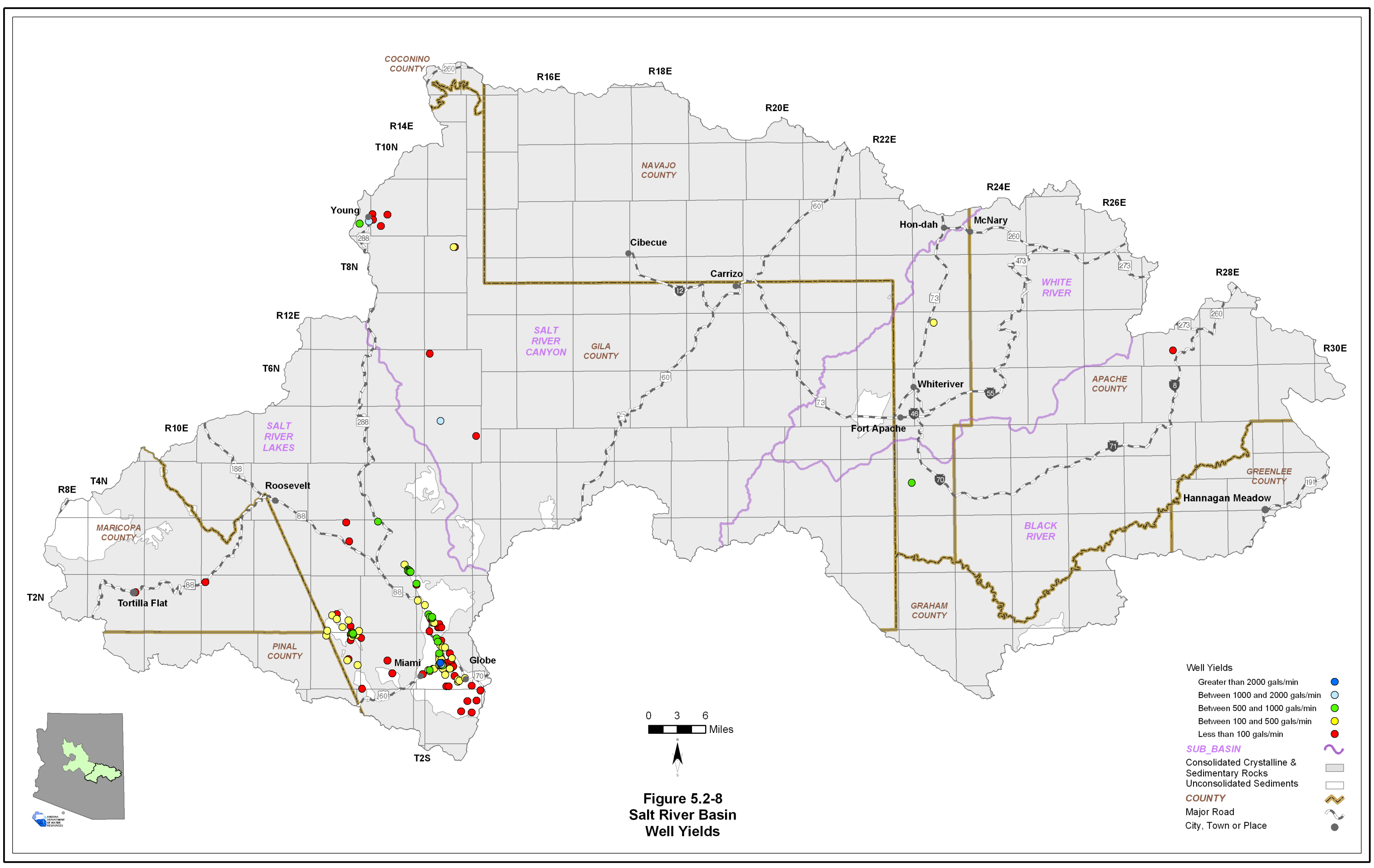



**Figure 5.2-8**
**Salt River Basin**
**Well Yields**

### 5.2.7 Water Quality of the Salt River Basin

Wells, springs and mine sites with parameter concentrations that have equaled or exceeded drinking water standard(s), including location and parameter(s) are shown in Table Table 5.2-7A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table Table 5.2-7B. Figure 5.2-9 shows the location of water quality occurrences keyed to Table 5.2-7. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

**Wells, Springs and Mines**

- Refer to Table 5.2-7A.
- Seventy sites have parameter concentrations that have equaled or exceeded drinking water standards All but one occurrence is in the southwest portion of the basin.
- Of the ten standards equalled or exceeded in this basin, the most commonly equalled or exceeded was cadmium.
- Multiple standards including fluoride, beryllium, copper, lead, cadmium, chromium and total dissolved solids were equalled or exceeded at sites in the vicinity of Miami-Globe.
- Other standards equalled or exceeded in this basin include nitrate/nitrite, arsenic and radionuclides.

**Lakes and Streams**

- Refer to Table 5.2-7B.
- Water quality standards in this basin were exceeded for two lakes and four stream reaches on two streams.
- The most commonly exceeded standard was copper. Other standards exceeded include dissolved oxygen, high pH and selenium.
- A total of 37 miles in three reaches of Pinto Creek are impaired.
- The three impaired reaches of Pinto Creek are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) program. Phase I of the TMDL reports have been approved and specific site standards are being developed.
- Canyon Lake, Crescent Lake and the Gibson Mine tributary are not a part of the TMDL program at this time.

## Table 5.2-7 Water Quality Exceedences in the Salt River Basin[1]

### A. Wells, Springs and Mines

| Map Key | Site Type | Site Location | | | Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2] |
|---|---|---|---|---|---|
| | | Township | Range | Section | |
| 1 | Well | 4 North | 29 East | 34 | NO3 |
| 2 | Well | 3 North | 12 East | 14 | Rad |
| 3 | Well | 3 North | 13 East | 2 | As |
| 4 | Well | 3 North | 13 East | 9 | As |
| 5 | Well | 3 North | 13 East | 10 | As |
| 6 | Well | 3 North | 13 East | 15 | As |
| 7 | Well | 3 North | 13 East | 15 | As |
| 8 | Well | 3 North | 14 East | 26 | Pb, TDS |
| 9 | Well | 3 North | 14 East | 26 | Pb, TDS |
| 10 | Well | 2 North | 9 East | 11 | As, F |
| 11 | Well | 2 North | 11 East | 6 | Rad |
| 12 | Spring | 2 North | 13 East | 16 | Rad |
| 13 | Well | 2 North | 14 East | 1 | F |
| 14 | Well | 2 North | 15 East | 6 | F |
| 15 | Well | 2 North | 15 East | 6 | F |
| 16 | Well | 2 North | 15 East | 6 | F |
| 17 | Well | 2 North | 15 East | 6 | F |
| 18 | Well | 2 North | 15 East | 6 | F |
| 19 | Well | 2 North | 15 East | 7 | Be, Cd, Cu, F, Pb |
| 20 | Well | 2 North | 15 East | 7 | Be, Cd, Cu, Pb |
| 21 | Well | 2 North | 15 East | 7 | Be, Cd, Cu, F, Pb |
| 22 | Well | 2 North | 15 East | 7 | Be, Cd, Cu, F |
| 23 | Well | 2 North | 15 East | 7 | Cd |
| 24 | Well | 2 North | 15 East | 7 | Be, Cd, Cr, Pb, TDS |
| 25 | Well | 2 North | 15 East | 7 | Pb |
| 26 | Well | 2 North | 15 East | 7 | Be, Cd, Cr, Pb, TDS |
| 27 | Well | 2 North | 15 East | 7 | Pb |
| 28 | Well | 2 North | 15 East | 7 | Cd, Pb, TDS |
| 29 | Well | 2 North | 15 East | 7 | Cd, Pb, TDS |
| 30 | Well | 2 North | 15 East | 7 | Cd |
| 31 | Well | 2 North | 15 East | 18 | Be, Cd, Cu, F, Pb, TDS |
| 32 | Well | 2 North | 15 East | 18 | Be, Cd, Cu, F, Pb, TDS |
| 33 | Well | 2 North | 15 East | 18 | Be, Cd, F, Pb |
| 34 | Well | 2 North | 15 East | 29 | TDS |
| 35 | Well | 2 North | 15 East | 29 | Be, Cd, Cu, F, Pb, TDS |
| 36 | Well | 2 North | 15 East | 29 | Be, Cd, Cu, F, Pb, TDS |
| 37 | Well | 2 North | 15 East | 29 | Be, Cd, Cu, F, Pb, TDS |
| 38 | Well | 2 North | 15 East | 29 | Cd |
| 39 | Well | 2 North | 15 East | 32 | As |
| 40 | Well | 1 North | 14 East | 27 | As |
| 41 | Well | 1 North | 15 East | 4 | Be, Cd, Cr, F, Pb, TDS |
| 42 | Well | 1 North | 15 East | 4 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 43 | Well | 1 North | 15 East | 4 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 44 | Well | 1 North | 15 East | 4 | Be, Cd, Cu, F, Pb |
| 45 | Well | 1 North | 15 East | 4 | Pb |
| 46 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 47 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 48 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 49 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, F, Pb, TDS |
| 50 | Well | 1 North | 15 East | 9 | Pb |
| 51 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, F, Pb |
| 52 | Well | 1 North | 15 East | 9 | Cu |
| 53 | Well | 1 North | 15 East | 9 | Cu |
| 54 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, Cr, F, Pb, TDS |
| 55 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, F, TDS |
| 56 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, F, TDS |
| 57 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, F, TDS |

## Table 5.2-7 Water Quality Exceedences in the Salt River Basin (cont'd)[1]

### A. Wells, Springs and Mines

| Map Key | Site Type | Site Location | | | Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2] |
|---|---|---|---|---|---|
| | | Township | Range | Section | |
| 58 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, Pb |
| 59 | Well | 1 North | 15 East | 9 | Be, Cd, Cu, TDS |
| 60 | Well | 1 North | 15 East | 23 | Cd |
| 61 | Well | 1 North | 15 East | 23 | Cd |
| 62 | Well | 1 North | 15 East | 23 | Cd |
| 63 | Well | 1 North | 15 East | 23 | Cd |
| 64 | Well | 1 North | 15 East | 23 | Cd |
| 65 | Well | 1 North | 15 East | 34 | Cd |
| 66 | Well | 1 North | 15 East | 34 | Cd, Pb |
| 67 | Well | 1 North | 15 East | 35 | Cd |
| 68 | Well | 1 South | 13 East | 12 | NO3 |
| 69 | Well | 1 South | 14 East | 2 | F |
| 70 | Well | 1 South | 15 East | 12 | NO3 |

### B. Lakes and Streams

| Map Key | Site Type | Site Name | Length of Impaired Stream Reach (in miles) | Area of Impaired Lake (in acres) | Designated Use Standard[3] | Parameter(s) Exceeding Use Standard[2] |
|---|---|---|---|---|---|---|
| a | Lake | Canyon Lake | NA | 450 | A&W | DO |
| b | Lake | Crescent Lake | NA | 150 | A&W, FBC, AgL, AgI | high pH |
| c | Stream | Gibson Mine tributary (headwaters to Pinto Creek) | 1 | NA | A&W | Cu |
| d | Stream | Pinto Creek (headwaters to tributary latitude 331927, longitude 1105456) | 3 | NA | A&W | Cu |
| e | Stream | Pinto Creek (Ripper Spring Canyon to Roosevelt Lake) | 18 | NA | A&W | Cu, Se |
| f | Stream | Pinto Creek tributary (latitude 331927, longitude 1105456 to Ripper Spring) | 16 | NA | A&W | Cu |

**Notes:**

[1] Water quality samples collected between 1984 and 2002.

[2] As = Arsenic
Be = Beryllium
Cd = Cadmium
Cr = Chromium
Cu = Copper
DO = Dissolved oxygen
F= Fluoride
Pb = Lead
NO3 = Nitrate/Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
pH = Measurement of acidity or alkalinity
Rad = One or more of the following radionuclides - Gross Alpha, Gross Beta, Radium, and Uranium
Se = Selenium
TDS = Total Dissolved Solids

[3] A&W = Aquatic and Wildlife
FBC = Full Body Contact
AgL - Agricltural - livestock watering
AgI = Agricultural - irrigation
NA = Not Available

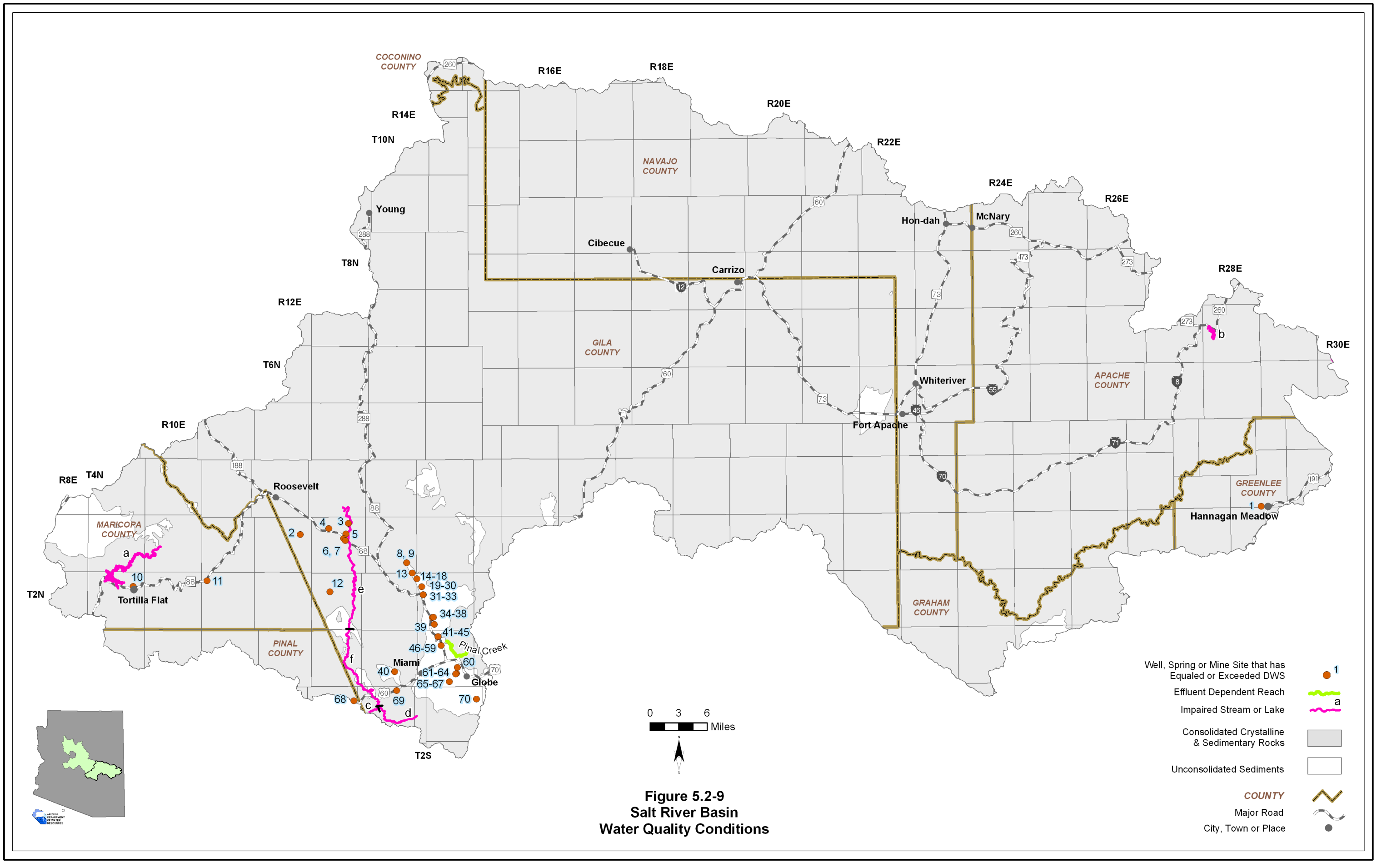



**Figure 5.2-9**
**Salt River Basin**
**Water Quality Conditions**

### 5.2.8 Cultural Water Demands in the Salt River Basin

Cultural water demand data including population, number of wells and the average well pumpage and surface water diversions by the municipal, industrial and agricultural sectors are shown in Table 5.2-8. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 5.2-9. Figure 5.2-10 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 5.0.7.

**Cultural Water Demands**

- Refer to Table 5.2-8 and Figure 5.2-10.
- Population in this basin has increased from 27,318 in 1980 to 32,144 in 2003 and is projected to reach 40,000 by 2050.
- Total groundwater use has decreased in this basin since 1971, from an average of 20,000 acre-feet per year from 1971-1975 to an average of 11,300 acre-feet per year in 2001-2003.
- From 1991-2003 municipal groundwater use averaged 4,000 acre-feet per year.
- Groundwater use for industrial purposes has decreased from 10,500 acre-feet per year on average in 1991-1995 to 8,000 acre-feet per year in 2001-2003.
- Groundwater use for irrigation occurs on non-reservation lands and has remained constant at less than 1,000 acre-feet per year on average from 1991-2003.
- Information on surface water diversions is not available from 1971-1990. Surface water diversions for both municipal and irrigation uses is assumed to have remained constant from 1991-2003. Municipal use averages less than 300 acre-feet per year and irrigation use averages 6,400 acre-feet per year.
- Surface water diversions for industrial use have decreased from an average of 6,300 acre-feet per year from 1991-1995 to 4,800 acre-feet per year during 2001-2003.
- Municipal and industrial demand is found in the Globe – Miami area, around Young and near Fort Apache and Whiteriver on the Fort Apache Indian Reservation.
- There are three large copper mines, Pinto Valley, Carlotta and Miami Mine, and two small mines or quarries located in the vicinity of Miami. Not all mines are currently in production.
- As of 2003 there were 1,491 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 216 wells with a pumping capacity of more than 35 gallons per minute.

**Effluent Generation**

- Refer to Table 5.2-9.
- There are twelve wastewater treatment facilities in this basin.
- Information on population served was available for seven facilities and information on effluent generation was available for six facilities. These facilities serve over 20,000 people and generate over 2,600 acre-feet of effluent per year.

- Of the seven facilities with information on the effluent disposal method: two discharge to evaporation ponds; two discharge for irrigation; one reuses effluent for irrigation, a wildlife area and a golf course; one facility discharges to the Globe WWTF and two discharge into a watercourse.

**Table 5.2-8 Cultural Water Demands in the Salt River Basin[1]**

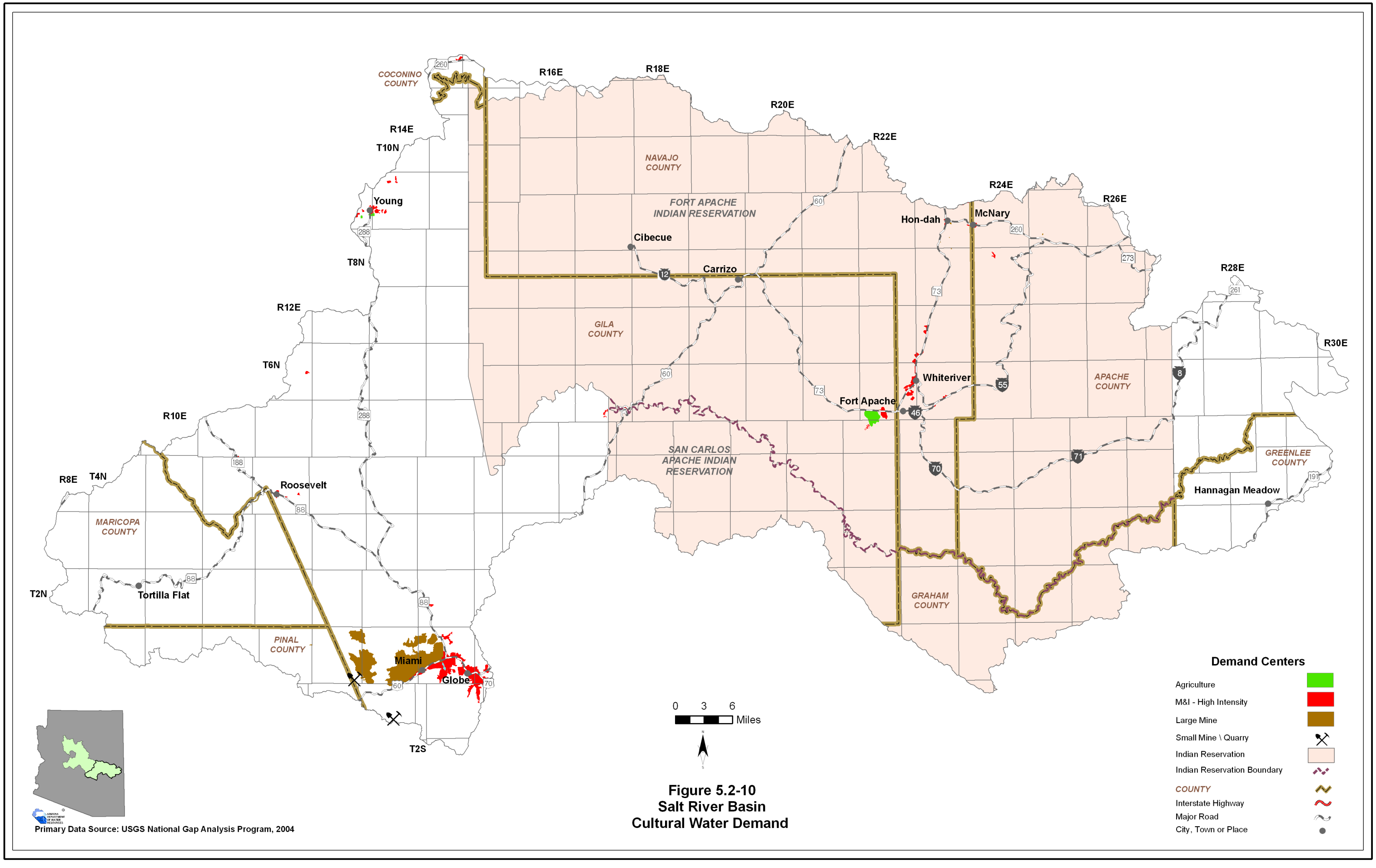
| Year | Recent (Census) and Projected (DES) Population | Number of Registered Water Supply Wells Drilled | | Average Annual Demand (in acre-feet) | | | | | | Data Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Well Pumpage | | | Surface-Water Diversions | | | |
| | | Q ≤ 35 gpm | Q > 35 gpm | Municipal | Industrial | Irrigation | Municipal | Industrial | Irrigation | |
| **1971** | | 989[2] | 158[2] | 20,000 | | | NR | | | ADWR (1994) |
| **1972** | | | | | | | | | | |
| **1973** | | | | | | | | | | |
| **1974** | | | | | | | | | | |
| **1975** | | | | | | | | | | |
| **1976** | | | | 20,000 | | | NR | | | |
| **1977** | | | | | | | | | | |
| **1978** | | | | | | | | | | |
| **1979** | | | | | | | | | | |
| **1980** | 27,318 | | | | | | | | | |
| **1981** | 27,453 | 25 | 11 | 20,000 | | | NR | | | |
| **1982** | 27,589 | | | | | | | | | |
| **1983** | 27,724 | | | | | | | | | |
| **1984** | 27,859 | | | | | | | | | |
| **1985** | 27,995 | | | | | | | | | |
| **1986** | 28,130 | 69 | 22 | 22,000 | | | NR | | | |
| **1987** | 28,265 | | | | | | | | | |
| **1988** | 28,401 | | | | | | | | | |
| **1989** | 28,536 | | | | | | | | | |
| **1990** | 28,671 | | | | | | | | | |
| **1991** | 28,942 | 140 | 8 | 3,900 | 10,570 | <1,000 | <300 | 6,300 | 6,400 | USGS (2005) ADWR (2005) ADWR (1992) Truini (2005) |
| **1992** | 29,213 | | | | | | | | | |
| **1993** | 29,484 | | | | | | | | | |
| **1994** | 29,755 | | | | | | | | | |
| **1995** | 30,026 | | | | | | | | | |
| **1996** | 30,297 | 182 | 12 | 4,100 | 7,570 | <1,000 | <300 | 6,600 | 6,400 | |
| **1997** | 30,568 | | | | | | | | | |
| **1998** | 30,839 | | | | | | | | | |
| **1999** | 31,110 | | | | | | | | | |
| **2000** | 31,381 | | | | | | | | | |
| **2001** | 31,635 | 38 | 3 | 4,000 | 8,070 | <1,000 | <300 | 4,800 | 6,400 | |
| **2002** | 31,889 | | | | | | | | | |
| **2003** | 32,144 | | | | | | | | | |
| **2010** | 33,923 | | | | | | | | | |
| **2020** | 36,006 | | | | | | | | | |
| **2030** | 37,774 | | | | | | | | | |
| **2040** | 39,175 | | | | | | | | | |
| **2050** | 40,609 | | | | | | | | | |
| ***ADDITIONAL WELLS:***[3] | | **45** | **2** | | | | | | | |
| ***WELL TOTALS:*** | | **1,491** | **216** | | | | | | | |

**Notes:**
NR - Not reported
[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes all wells through 1980.
[3] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.

**Table 5.2-9 Effluent Generation in the Salt River Basin**

| Facility Name | Ownership | City/Location Served | Population Served | Volume Treated/Generated (acre-feet/year) | Disposal Method | | | | | | | Current Treatment Level | Population Not Served | Year of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Water-course | Evaporation Pond | Irrigation | Wildlife Area | Golf Course | Discharge to Another Facility | Infiltration Basin | | | |
| Arizona DOC/Globe | Department of Corrections | Prison | NA | | | | | | | | | | | |
| Cobra Valley Plaza | Cobra Valley SD | Claypool | 100 | 11 | Miami Wash | | | | | | | Secondary | NA | 2000 |
| Globe Central Heights Collection Systems | Globe | Globe | 1,990 | NA | | | | | | Globe WWTF | | NA | | 2001 |
| Globe Holgate STP | Globe | Globe | 190 | 22 | NA | | | | | | | Secondary | NA | 2000 |
| Globe WWTF | Globe | Globe | 190 | 784 | Unnamed wash to Pinal Creek | | X | | | | | Secondary | NA | 2001 |
| Hon-Dah WWTP | White Mountain Apache Tribe | Resort | NA | | | | | | | | | | | |
| Houston Creek Landing | Private | Star Valley | NA | | | | | | | | | | | |
| Miami WWTF | Miami | Miami | 5,238 | 488 | | | X | | | | | Secondary | 762 | 2000 |
| Pinal Creek | Globe | Globe | NA | | | | Reuse | | | | | NA | | 2004 |
| Roosevelt WWTP | Tonto National Forest | Recreation Area | NA | | | | | | | | | | | |
| White Mountain Apache | White Mountain Apache Tribe | Reservation | 2,000 | 224 | | X | | | | | | Secondary | 1,250 | 2000 |
| White River | White Mountain Apache Tribe | White River | 10,700 | 1,120 | | X | | | | | | Secondary | 2000 | 2000 |
| Total | | | 20,408 | 2,649 | | | | | | | | | | |

NA: Data not currently available to ADWR
WWTF: Waste Water Treatment Facility
WWTP: Waste Water Treatment Plant
STP:Sewage Treatment Plant
SD: Sanitation District




Primary Data Source: USGS National Gap Analysis Program, 2004

**Figure 5.2-10**
**Salt River Basin**
**Cultural Water Demand**

### 5.2.9 Water Adequacy Determinations in the Salt River Basin

Water adequacy determination information including the subdivision name, location, number of lots, adequacy determination, reason for the inadequacy determination, date of determination and subdivision water provider are shown in Table 5.2-10. Figure 5.2-11 shows the locations of subdivisions keyed to the Table. A description of the Water Adequacy Program is found in Volume 1, Appendix A. Adequacy determination data sources and methods are found in Volume 1, Sections 1.3.1.

**Water Adequacy Reports**

- See Table 5.2-10
- A total of seventeen water adequacy determinations have been made in this basin through May, 2005.
- Fifteen subdivisions received inadequate determinations.
- The most common reason for an inadequacy determination is because the applicant did not submit the necessary information and/or the available hydrologic data was insufficient to make a determination.
- Other reasons for an inadequacy determination were because the existing water supply was unreliable or unavailable or the groundwater exceeded the depth-to-water criteria.
- The number of lots receiving a water adequacy determination, by county, are:

| County | Number of Subdivision Lots | Number of Lots Determined to be Adequate | Percent Adequate |
|---|---|---|---|
| Apache County | 0 | 0 | NA |
| Coconino County | 0 | 0 | NA |
| Gila County | 909 | 47 | 5% |
| Greenlee County | 0 | 0 | NA |
| Graham County | 0 | 0 | NA |
| Navajo County | 59 | 59 | 100% |
| Maricopa County | 0 | 0 | NA |

**Table 5.2-10. Adequacy Determinations in the Salt River Basin[1]**

| Map Key | Subdivision Name | County | Location | | | No. of Lots | ADWR File No.[2] | ADWR Adequacy Determination | Reason(s) for Inadequacy Determination[3] | Date of Determination | Water Provider at the Time of Application |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Township | Range | Section | | | | | | |
| 1 | Cherry Creek Estates Amended | Gila | 9.0 | 14.0 | 4 | 55 | | Inadequate | A1 | 04/18/88 | Dry Lot Subdivision |
| 2 | Copper Canyon Ranches #1 | Gila | 1.0 | 15.0 | 2, 3, 10 | 53 | | Inadequate | A1 | 10/16/90 | Dry Lot Subdivision |
| 3 | Country Club Annex | Gila | 1.0 | 15.0 | 22 | 46 | | Inadequate | A1 | 07/30/85 | Arizona Water Company |
| 4 | Country Club Annex Unit 1 | Gila | 1.0 | 15.0 | 22 | 34 | 22-300428 | Inadequate | A1 | 03/27/98 | Arizona Water Company |
| 5 | Dream Catcher Ranch | Gila | 6.0 | 13.0 | 24, 25 | 63 | 22-300058 | Inadequate | A2 | 10/20/95 | Dry Lot Subdivision |
| 6 | Kristy Terrace | Gila | 1.0 | 15.0 | 22 | 10 | | Inadequate | A1, A2 | 06/10/76 | Arizona Water Company |
| 7 | Kristy Terrace # 2 | Gila | 1.0 | 15.0 | 22 | 7 | | Inadequate | A1 | 04/20/84 | Arizona Water Company |
| 8 | Miami Gardens | Gila | 1.0 | 15.0 | 21, 27 | 40 | | Inadequate | A2 | 07/07/75 | Arizona Water Company |
| 9 | Morning Shadow Estates | Gila | 1.0 | 15.0 | 22 | 50 | | Inadequate | A2 | 02/23/77 | Arizona Water Company |
| 10 | Mountain Gate Unit One | Navajo | 9.0 | 22.0 | 16 | 59 | 22-400802 | Adequate | | 10/09/02 | Arizona Water Company - Lakeside |
| 11 | Pinto Creek Valley | Gila | 3.0 | 13.0 | 11 | NA | | Inadequate | A1 | 05/22/92 | Roosevelt Lake Resort Water Company |
| 12 | Pioneer Hills | Gila | 1.0 | 15.0 | 15, 22 | 170 | | Inadequate | A1, A2 | 09/03/74 | Arizona Water Company |
| 13 | Quail Run Mobile Home Subdivision | Gila | 3.0 | 13.0 | 15 | 74 | 22-300053 | Inadequate | A1 | 10/11/95 | Quail Run Homeowners' Association |
| 14 | Quail Run Subdivision | Gila | 3.0 | 13.0 | 15 | 74 | 22-300174 | Inadequate | A1 | 07/17/96 | Quail Run Homeowners' Association |
| 15 | Roosevelt Lake RV Resort | Gila | 3.0 | 13.0 | 15 | 167 | | Inadequate | A1 | 03/11/93 | Utility Management Services and Operations, |
| 16 | Sierra Grande | Gila | 1.0 | 15.0 | 14 | 19 | | Inadequate | A2 | 02/07/75 | Arizona Water Company |
| 17 | Tierra Madre | Gila | 9.0 | 13.0 | 24 | 47 | | Adequate | | 02/23/77 | Dry Lot Subdivision |
| | | | | 14.0 | 19 | | | | | | |

Notes:

[1]Each determination of the adequacy of water supplies available to a subdivision is based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. In some cases, ADWR might make a different determination if a similar application were submitted today, based on the hydrologic data and other information currently available, as well as current rules and policies.

[2] Prior to February 1995, ADWR did not assign file numbers to applications for adequacy determination.

[3] A. Physical/Continuous
1) Insufficient Data (applicant chose not to submit necessary information, and/or available hydrologic data insufficient to make determination)
2) Insufficient Supply (existing water supply unreliable or physically unavaible;for groundwater, depth-to-water exceeds criteria)
3) Insufficient Infrastructure (distribution system is insufficient to meet demands or applicant proposed water hauling)
B. Legal (applicant failed to demonstrate a legal right to use the water or failed to demonstrate the provider's legal authority to serve the subdivision)
C. Water Quality
D. Unable to locate records
NA = Not Available

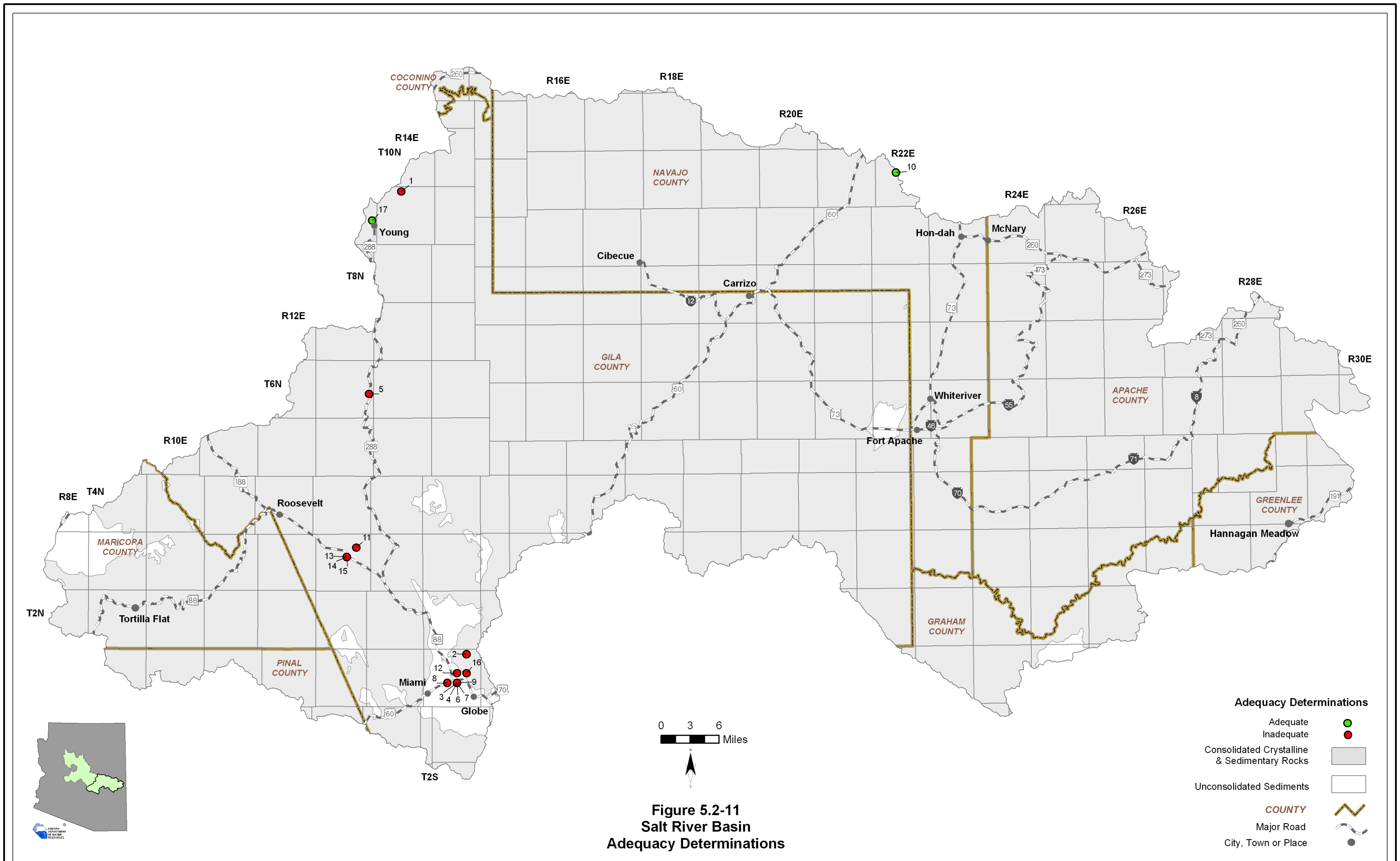



**Figure 5.2-11**
**Salt River Basin**
**Adequacy Determinations**

# Salt River Basin
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